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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/889,913 | 12/13/2001 | Kineo Matsui | MES1P043 | 3027 |
| 22434 | 7590 | 04/28/2005 | EXAMINER | |
| BEYER WEAVER & THOMAS LLP P.O. BOX 70250 OAKLAND, CA 94612-0250 | | | HENNING, MATTHEW T | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2131 | |

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 09/889,913 | Applicant(s) MATSUI, KINEO | |
| | Examiner Matthew T. Henning | Art Unit 2131 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-20 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 23 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This action is in response to the communication filed on 2/14/2005.

DETAILED ACTION

1. All objections and rejections not set forth below have been withdrawn.
2. Claims 1-20 have been examined.

Title

3. The title of the invention is acceptable.

Priority

4. This application is a 371 of PCT/JP00/00334, filed 01/24/2000, which claims priority to Japanese Application 1115674 filed 01/25/1999.
5. The effective filing date for the subject matter defined in the pending claims in this application is 01/25/1999.

Information Disclosure Statement

6. The information disclosure statement (IDS) submitted on 03/11/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Drawings

7. The drawings filed on 12/13/2001 are acceptable for examination proceedings.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 7-11, and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isnardi et al. (US Patent Number 6,037,984) hereinafter referred to as Isnardi, and further in view of Shin (US Patent Number 6,415,042).

10. Regarding Claim 1, Isnardi recites a method of embedding a digital watermark in a master image (See Isnardi Abstract Line 1), said embedding method comprising the steps of: extracting blocks of a predetermined size from said master image (See Isnardi Col. 3 Lines 52-54); processing image data corresponding to each block by orthogonal transform (See Isnardi Col. 4 Lines 7-11); making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Isnardi Col. 4 Paragraph 3); and processing each block with the embedded bit information by inverse orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Isnardi Col. 7 Lines 25-42). However, Isnardi failed to disclose comparing orthogonal transformed coefficients of at least two blocks having a predetermined relationship with each other.

Shin teaches that in order to allow for an evaluation of the quality of a host image, an NxN watermark should be placed in a portion of the 50% of upper significant coefficients selected among an MxM image (See Shin Col. 5 Paragraph 6).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Shin to the watermarking system of Isnardi by determining which coefficients were most significant in order to select the location for the watermark. This would have been obvious because the ordinary person skilled in the art would have been

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motivated to provide an accurate estimate of the quality of the host image without having to send the whole watermarked image.

11. Regarding Claim 2, the NxN block was selected from the entire MxM block and therefore the blocks were contiguous (See Shin Col. 2 Paragraph 4).
12. Regarding Claim 3, Isnardi disclosed the use of DCT (See Isnardi Abstract).
13. Regarding Claim 4, Isnardi disclosed the use of a quantizer to quantize the coefficients and then using the quantized coefficients for watermarking (See Isnardi Col. 4 Lines 7-11 and Paragraphs 2-3).
14. Regarding Claim 5, Isnardi disclosed converting the blocks into luminance and chrominance blocks prior to the DCT step (See Isnardi Col. 2 Lines 52-60), and watermarking the blocks (See Isnardi Col. 5 Paragraph 7- Col. 6 Paragraph 1).
15. Regarding Claim 7, Isnardi disclosed comparing the block with a predicted block, derived from the previous block, and then deciding, based on that comparison, whether or not to alter the watermarking procedure (See Isnardi Col. 3 Line 64 – Col. 4 paragraph 1 and Col. 4 Paragraph 5 – Col. 5 Paragraph 1).
16. Regarding Claim 8, Isnardi disclosed using a pseudo-random generator and seed (key) to create the bits to be embedded at each coefficient (See Isnardi Col. 6 Paragraph 4). See also rejection of claim 7 above.
17. Regarding Claim 9, Isnardi disclosed creating a binary watermark pattern and embedding the watermark (See Isnardi Col. 6 Paragraph 3).
18. Regarding Claim 10, Isnardi disclosed watermarking the image iteratively on a block-by-block basis (See Isnardi Col. 2 Lines 27-30) and that multiple coefficients were marked in each

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block (See Isnardi Figs 3-5). Therefore, it was inherent that there were more watermark elements than number of blocks.

19. Regarding Claim 11, Isnardi disclosed that a binary representation of a trademark or another word was used for the watermark (See Isnardi Col. 6 Paragraph 3). Because the watermark is being used for an image sequence, it was inherent that the watermark over the sequence was redundant.

20. Regarding Claim 13, Isnardi and Shin disclosed extracting blocks of DCT coefficients containing watermark information (See Isnardi Col. 7 Lines 3-9), an inverse DCT operation on the DCT blocks (See Isnardi Col. 7 Lines 38-41), and comparing the coefficients to determine if they match the watermarks (See Isnardi Col. 7 Lines 16-31).

21. Regarding Claim 14, Isnardi disclosed that decompression took place on a block-by-block basis (See Isnardi Col. 2 Paragraph 6).

22. Regarding Claim 15, Isnardi disclosed converting the blocks into luminance and chrominance blocks prior to the DCT step (See Isnardi Col. 2 Lines 52-60), and extracting the watermark information from the coefficients of the received data, which included luminance data (See Isnardi Col. 7 Lines 16-31).

23. Regarding claim 16, Isnardi disclosed extracting the watermark from the watermarked images (See Isnardi Col. 7 Lines 16-31).

24. Claim 17 is rejected for the same reasons as claim 1 above.

25. Claim 18 is rejected for the same reasons as claim 13 above.

26. Claims 19 and 20 are rejected for the same reasons as claims 1 and 13 above and further because Shin disclosed that watermarking can be done with software (See Shin Col. 6 Paragraph 11 – Col. 7 Paragraph 1).

27. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Isnardi and Shin as applied to claim 4 above, and further in view of Bhaskaran et al. (US Patent Number 6,064,764) hereinafter referred to as Bhaskaran.

The combination of Isnardi and Shin disclosed quantizing the coefficients of the DCT transformed blocks (See rejection of claim 4 above), but failed to disclose only embedding the watermark data where the coefficients are not zero.

Bhaskaran teaches that in order to keep the compression rate of the encoding of images, watermark data should not be added where DCT coefficients are equal to zero (See Bhaskaran Col. 5 Paragraph 2).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Bhaskaran to the watermarking system of Isnardi and Shin by only choosing coefficients that are non-zero to watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to increase the compression potential of the watermarked image.

28. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Isnardi and Shin as applied to claim 10 above, and further in view of Ohbuchi et al. (“Watermarking Three-Dimensional Polygonal Modals”), hereinafter referred to as Ohbuchi.

The combination of Isnardi and Shin disclosed embedding the pattern iteratively (See rejection of claim 10 above), but failed to disclose the pattern being a density pattern.

Ohbuchi teaches that density pattern embedding in polygonal models withstands practically every geometrical transformation attack (See Ohbuchi Page 271 Col. 1 Section 3.5).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Ohbuchi to the combination of Isnardi and Shin by using a density pattern as the watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to provide watermark protection to polygonal models as well as plain images.

Response to Arguments

29. Applicant's arguments filed 2/14/2005 have been fully considered but they are not persuasive. Applicant traverses primarily that:

- i. The system of Isnardi is incapable of incapable of compressing data that have been discrete-cosine-transformed.
- ii. Isnardi failed to disclose using the discrete-cosine-transformed coefficients of multiple blocks extracted from an image in order to embed a digital watermark.
- iii. Isnardi failed to disclose comparing orthogonal transformed coefficients of at least two blocks having a predetermined relationship with each other.
- iv. Shin does not anticipate comparison of orthogonal transformed coefficients of at least two blocks.
- v. No teaching in the cited references of extracting two blocks of image data having a predetermined relationship.

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30. In response to applicant's argument i. that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., compressing data that have been discrete-cosine-transformed) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As such, regarding applicant's argument i. with regards to claims 1, 13, 17, 18, 19, and 20, the examiner does not find the argument persuasive.

31. In response to applicant's arguments, ii. iii. and iv. against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

32. Regarding applicant's argument ii., that Isnardi failed to disclose using the discrete-cosine-transformed coefficients of multiple blocks extracted from an image in order to embed a digital watermark, the examiner does not find the argument persuasive. Isnardi did in fact disclose using the discrete-cosine-transformed coefficients of multiple blocks extracted from an image to embed a digital watermark. It can be seen that multiple blocks were extracted from an image in Col. 3 Lines 50-63 wherein an image frame is divided into blocks of data. It can be seen that each block was discrete-cosine-transformed in Col. 3 Line 64 – Col. 4 Line 11 wherein each block is processed by DCT transform. It can be seen that the DCT transformed blocks are then used to embed watermark data in Col. 4 Lines 20-34 wherein the DCT transformed blocks are watermarked. As such, the examiner does not find the applicant's argument persuasive.

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33. Regarding applicant's argument iii., that Isnardi failed to disclose comparing orthogonal transformed coefficients of at least two blocks having a predetermined relationship with each other, the examiner agrees with the statement, but still does not find the argument persuasive. This is due to the fact that the rejected claims were rejected in view of a combination of references and not just in view of Isnardi. As such, as explained in the rejection above, Shin provides the necessary teachings regarding comparing blocks of transformed coefficients as can be seen in Col. 5 Paragraphs 5-6 of Shin. The combination of Isnardi and Shin clearly provide the limitation of comparing multiple blocks (from Shin in order to determine which coefficients were most significant) of the orthogonal transformed coefficients (DCT) of Isnardi. Further, Isnardi disclosed that the multiple blocks do in fact have a predetermined relationship, at the least that they are in the same image frame, as can be seen in Isnardi Col. 3 Lines 50-60. As such the examiner does not find the applicant's arguments persuasive.

34. Regarding applicant's argument iv., that Shin does not anticipate comparison of orthogonal transformed coefficients of at least two blocks, the examiner does not find the argument persuasive. This is due to the fact that the rejected claims were rejected in view of a combination of references and not just in view of Isnardi. As such, as explained in the rejection above, Shin provides the necessary teachings regarding comparing blocks of transformed coefficients, which can be seen in Col. 5 Paragraphs 5-6 of Shin, to the system of Isnardi. Isnardi disclosed that the blocks contained orthogonally transformed coefficients, as can be seen in Col. 4 Paragraph 1. As such, the examiner does not find the arguments persuasive.

35. Regarding applicant's argument v., that there was no teaching in the cited references of extracting two blocks of image data having a predetermined relationship, the examiner does not

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find the argument persuasive. Isnardi clearly disclosed this limitation in Col. 3 Lines 50-60, wherein multiple blocks of image data were extracted from the same image frame, which provides that the blocks did in fact have a predetermined relationship to each other. Therefore, the examiner does not find the argument persuasive.

36. Because the arguments presented by the applicant have not been found to be persuasive by the examiner, the examiner has maintained the rejection presented above.

Conclusion

37. Claims 1-20 have been rejected.

38. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Cox et al. (US Patent Number 5,915,027) disclosed a method for digital watermarking involving spectral transformations and blocking.
- b. Cox et al. (US Patent Number 6,154,571) disclosed a method for watermarking high quality images, or DVD video, with no visible distortion to the images.
- c. Nakagawa et al. (US Patent Number 6,104,826) disclosed a method for watermarking the luminance portion of an image signal.
- d. Wu et al. (US Patent Number 6,285,775) disclosed a method for watermarking involving random shuffling of blocks before inserting the watermark.
- e. Natarajan ("Robust Public Key Watermarking of Digital Images") disclosed a method for watermarking images involving watermarking a block of image rows.

39. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action

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is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Matthew Henning
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4/18/2005



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